

What is claimed is:

1        1. A cooperative stent adapted to be implanted in a patient's body into an  
2 acutely angled side branch at a junction of bifurcation from a main vessel, duct or tract,  
3 said cooperative stent having an acutely angled end adapted to reside against a portion of a  
4 separate main stent implanted in the main vessel, duct or tract bridging said bifurcation  
5 junction, such that the cooperative stent when implanted fully covers the inner wall surface  
6 of said side branch at said bifurcation junction, with negligible gaps.

1        2. The cooperative stent of claim 1, wherein the acute angle of said acutely  
2 angled end is approximately 45°.

1        3. The cooperative stent of claim 1, wherein the end of the cooperative stent  
2 opposite said acutely angled end is at a different angle therefrom relative to the  
3 longitudinal axis of the stent.

1        4. The cooperative stent of claim 3, wherein said different angle of the end of  
2 the cooperative stent opposite said acutely angled end is approximately 90°.

1        5. The cooperative stent of claim 1, wherein said acutely angled end has a  
2 short side and a long side connected by a straight cut through the wall of the cooperative  
3 stent.

1        6. The cooperative stent of claim 5, wherein at least one of said short side and  
2 said long side has an identifying radiopaque parameter to enable viewing and properly  
3 orienting the cooperative stent during implant thereof in the side branch.

1       **7.**     The cooperative stent of claim 1, wherein the outer surface of the  
2 cooperative stent has a coating including a drug selected to hinder restenosis, for elution of  
3 said drug from the cooperative stent when implanted in the side branch.

1       **8.**     The cooperative stent of claim 1, wherein said acutely angled end of the  
2 cooperative stent is adapted to reside against the main stent at an opening along said  
3 bridging portion thereof to allow a portion of fluid carried by the main vessel, duct or tract  
4 to flow relatively unobstructed through said bifurcation junction into the side branch.

1       **9.**     A stent adapted to be implanted in a side branch at a bifurcation from a  
2 main blood vessel in a patient's body, wherein the bifurcation from the main vessel is at  
3 other than a right angle, said stent having open ends, one of which is angled to match the  
4 angulation of the side branch, whereby to afford substantially complete coverage of the  
5 inner wall of the side branch at said bifurcation, when the stent is implanted.

1       **10.**    The stent of claim 9, wherein said other than a right angle is about 45°.

1       **11.**    The stent of claim 10, wherein the other open end of the stent is at a right  
2 angle to the longitudinal axis of the stent.

1       **12.**    The stent of claim 9, wherein said other than a right angle matched by the  
2 angle of said one open end of the stent gives the stent a short side and a long side  
3 connected together in a plane through the wall of the stent at said one open end.

1       **13.**    The stent of claim 12, wherein at least one of said short side and said long  
2 side has a viewable radiopaque characteristic to facilitate proper orientation of the stent  
3 during implant thereof.

1       **14.**    The stent of claim 9, including a drug-eluting surface coating on the stent to  
2 resist stenosis of the side branch when the stent is implanted therein.

1           **15.** A stent comprising a single straight tubular wall patterned with a plurality  
2 of interconnected struts having voids therebetween, and a pair of openings at opposite ends  
3 of the wall, said ends skewed relative to one another.

1           **16.** The stent of claim **15**, wherein a skewed one of said ends has a  
2 fluoroscopically visible marker for properly orienting the stent during implantation.

1           **17.** A stent comprising a single tube with a multiplicity of through-holes in its  
2 side, and one of its two open ends skewed relative to said side, whereby to enable said  
3 stent to be implanted in mating relation to the geometry of a side branch similarly skewed  
4 relative to a main blood vessel at a bifurcation thereof.

1           **18.** The stent of claim **17**, wherein said one skewed end is fluoroscopically  
2 identifiable to enable proper orientation of the stent during implantation in the side branch.

1           **19.** A stent adapted to be implanted in a side branch at a skewed bifurcation  
2 from a main blood vessel in a patient's body, in combination with a stent delivery system  
3 including a balloon catheter on which the stent is mounted for navigation through the main  
4 vessel and deployment of the stent in the side branch at said bifurcation, the stent having  
5 one of its open ends angled to match the skew of the bifurcation of the side branch, the  
6 stent being mounted on the balloon catheter with its matching angled end positioned  
7 proximally thereon.

1           **20.** The combination claimed in claim **19**, wherein at least one of said stent and  
2 said balloon catheter has at least one fluoroscopically visible marker at said matching  
3 angled end of the mounted stent for properly orienting the stent during deployment in the  
4 side branch.

1           **21.** The combination claimed in claim **19**, wherein at least one of said stent and

2 said balloon catheter has fluoroscopically identifiable markers at the shorter and longer  
3 sides of said matching angled end of the mounted stent to facilitate rotation of the catheter  
4 and proper orientation of the stent for deployment in the side branch.

1           **22.** A method of implanting a stent in a side branch at a skewed bifurcation  
2 from a main blood vessel in a patient's body, which comprises the steps of selecting a  
3 balloon catheter on which the stent is mounted with an open end of the stent, angled to  
4 match the side branch skew of the bifurcation, positioned proximally on the catheter;  
5 navigating the catheter through the main vessel and the side branch until the stent is  
6 positioned in the side branch at the bifurcation; rotating the catheter to an extent necessary  
7 to orient said angled end of the stent for substantially complete coverage of the inner wall  
8 of the side branch at the bifurcation; and deploying the stent to engage the inner wall of the  
9 side branch and thereby effect said coverage by inflating the balloon of the catheter.

1           **23.** The method of claim 22, including deflating the balloon and withdrawing  
2 the catheter from the patient's body after the stent is deployed.

1           **24.** A method of fabricating a stent to be implanted in a side branch at or  
2 adjacent the origin of a skewed bifurcation from a main blood vessel in a patient's body,  
3 which comprises the steps of providing a single metal tube of predetermined length,  
4 diameter and sidewall thickness and having at least one of its open ends angled at about  
5 90° relative to the longitudinal axis of the tube; and, either before or after forming the other  
6 open end of the tube at an acute angle chosen to match the skew angle of the side branch  
7 bifurcation from the main vessel, patterning the tube with a multiplicity of holes through  
8 its sidewall to enable the tube diameter to be expanded from its starting dimension to a  
9 deployment dimension suitable for implanting the stent in the side branch.